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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,985	06/09/2000	Harry R. Allcock	99-2127	2041

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EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

10

DATE MAILED: 01/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/590,985	ALLCOCK ET AL.	
	Examiner	Art Unit	
	Dah-Wei D. Yuan	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5, 8 and 11 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 9, 10, 12 and 13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: _____ |

PROTON CONDUCTING POLYMER MEMBRANES

Examiner: Yuan S.N. 09/590,985 Art Unit: 1745 January 8, 2003

Detailed Action

1. The Applicant's amendment filed on February 15, 2002 was received. Claims 1,5,8,12,13 were amended.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (Paper No. 4).

Claim Rejections - 35 USC § 112

3. Claims 1-4,6,7,9,10,12,13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. The terms "slowly" and "uniform" in claims 1,12,13 are a relative term which render the claims indefinite. The term "slowly" and "uniform" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

5. Claims 1,3,4,6,7,10,12,13 are rejected under 35 U.S.C. 102(e) as being anticipated by Formato et al. (US 6,248,469 B1).

Formato et al. teach a process of making a solid polymer electrolyte membrane that is used in a direct methanol fuel cell. The process involves the steps of preparing a mixture of a polymer substrate and an ion-conducting material in a common solvent and casting a solid membrane from the mixture. The preferred polymer substrates include polyester, polyvinyl, and polystyrene. The preferred solvents include tetrahydrofuran, sulfuric acid, phosphoric acid, chlorosulfonic acid and polyphosphoric acid (oxyacids). The polymer substrate is first dissolved in the solvent followed by the drop-wise addition of the acid solution. The reaction is stopped by the additions of deionized water to the mixture. The membrane film is then cast on soda lime glass plate and left to stand in a dry box with a relative humidity less than 5% for a period of 24 hours to remove the organic solvent. See Column 5, Lines 37-40; Column 7, Lines 23-28; Column 8, Lines 13-26; Examples 1 & 4 and Table 7.

Claim Rejections - 35 USC § 103

6. Claims 2,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Formato (US 6,248,469 B1).

The disclosure of Formato et al. differs from Applicant's claims in that Formato et al. do not specifically disclose the amounts of water added to the oxyacid-containing polymer solution. However, it could have been within the skill of the ordinary artisan to adjust the amounts of the water in the mixture depending upon desired reaction kinetics of the mixture. Where the general conditions of a claim are disclosed in the prior art it is not inventive to discover the optimum or

workable ranges by routine experimentation. In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215.

Moreover, Formato et al. cast the membrane film on a soda lime glass surface instead of a polytetrafluoroethylene surface. Glass and polytetrafluoroethylene are considered to be functionally equivalent. Therefore, it would have been obvious to one of ordinary skill in the art to substitute a polytetrafluoroethylene substrate for the soda lime glass in the process disclosed by Formato et al.

Allowable Subject Matter

8. Claims 5,8 are allowed. The invention of independent claim 5 recites a method for making a proton conducting polymeric membrane comprising the steps of dissolving a polymer in an organic solvent wherein the polymer is a polyphosphazene as stated in the claim. The closest prior art of record, Formato et al, does not disclose or suggest a method for making a proton conducting polymeric membrane by using polyphosphazene.

9. Claim 11 is allowed. The following is a statement of reasons for the indication of allowable subject matter: The invention of independent claim 11 recites a proton conducting polymeric membrane comprising a mixture of polyphosphazene and an oxyacid. The closest prior art of record, Formato et al, does not disclose or suggest a proton conducting polymeric membrane comprising polyphosphazene

Response to Arguments

10. Applicant's arguments filed on February June 14, 2001 have been fully considered but they are not persuasive.

Applicant's principle arguments are

(a) the acid used in the preparation of membrane is either washed away or neutralized in the Formato reference;

(b) subject matter recites the removal of organic solvent at a sufficiently slow rate.

In response to Applicant's arguments, please consider the following comments.

(a) the term "comprising" in independent claims 1,12,13 is an open language, which does not exclude additional steps in the fabrication of the proton conducting polymeric membrane.

(b) Formato reference teaches the cast film to be kept in a dry box of low humidity for 24 hours, which is similar to the procedures disclosed in the instant specification. See page 7, lines 3-15.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

Art Unit: 1745

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan
January 8, 2003


CAROL CHANEY
PRIMARY EXAMINER